

Interagency Ecological Program Stakeholder Meeting

February 8, 2017

1:30-3:30pm

Dept. of Water Resources
3500 Industrial Blvd, Rm 119
West Sacramento, CA 95691



**Interagency
Ecological Program**
COOPERATIVE ECOLOGICAL
INVESTIGATIONS SINCE 1970

Attendees:

| | |
|-------------------------|------------------------------|
| Shawn Acuna, MWD | Dick Pool, GGSA |
| Kaylee Allen, USFWS | Ted Sommer, DWR |
| Denise Barnard, USFWS | Stephani Spaar, DWR |
| Marina Brand, DSC | Becky Stanton, SSJDC |
| Pat Brandes, USFWS | Lisa Thompson, RegionalSan |
| Louise Conrad, DWR | Vanessa Tobias, CDFW |
| Kelsey Cowin, SFCWA | Laura Valoppi, SFCWA |
| Steve Culberson, IEP | Erwin Van Nieuwenhuyse, USBR |
| Julie Day, USFWS | Dave Zezulak, CDFW |
| Gregg Erickson, CDFW | |
| Sakura Evans, CDFW | Phone: |
| Alison Febbo | Charlotte Ambrose, NOAA |
| Karen Gehrts, DWR | Frances Brewster, |
| Peggy Lehman, CDFW | Baker Holden, USFWS |
| Sarah Lesmeister, DWR | Holly Long |
| Jon Marshack, CWQMC | Lynda Smith |
| Tim Mussen, RegionalSan | Dave Van Rijn, USBR |
| Jonathan Nelson, CDFW | |

1. Welcome, introductions, and consideration of agenda

Erwin Van Nieuwenhuyse (USBR), EVanNieuwenhuyse@usbr.gov

2. IEP Updates: 2018 IEP Work Plan

Gregg Erickson (CDFW), Gregg.Erickson@wildlife.ga.gov

- When are proposals for the 2018 Work Plan due?
 - Early concepts are due in April 2017
- When are full proposals due?
 - June 2017
 - The IEP will share the preliminary 2018 Work Plan with the Stakeholders in August 2017
- What is the rough amount of funding allotted for Directed Studies annually?

- It varies greatly. It could be \$0 to millions. Unfortunately, there is no pool of money available right now, and that's part of the problem. This year, DOI was able to support additional efforts on smelt and there was settlement money to support predation work. However, it's difficult to predict this early in the year.

3. 2017 IEP Annual Workshop

Sakura Evans (CDFW), Sakura.Evans@Wildlife.ca.gov

- March 1-3, 2017, Lake Natoma Inn, Folsom, CA
- Objective of the workshop is to share the science from IEP and the larger science community, including preliminary
- Workshop attendance is open to all; speakers are by invite only; poster call is open to all
- Contact Sakura Evans if you are interested in participating on the workshop planning committee for the 2018 IEP Annual Workshop

4. Update on Enhanced Delta Smelt Monitoring program

Kaylee Allen (USFWS), kaylee_allen@fws.gov

- Kaylee is the Field Supervisor for Bay-Delta USFWS office
- Julie Day is the Program Manager for DJFMP, in the Lodi USFWS office
- Denise Barnard is the Project Lead for EDSM, in the Lodi USFWS office
- USFWS anticipates the effort will be modified over time as results come in and management questions shift
- Weekly summaries are posted on the EDSM website, and whole data will eventually go on BayDeltaLive
 - https://www.fws.gov/loji/juvenile_fish_monitoring_program/jfmp_index.htm
- How will you be sure that you won't significantly impact the populations?
 - Went through 10A-1A analysis for this program
 - Lodi office stopped other actions and reassigned that take to EDSM
 - If bump against take limit, will stop and reassess
 - Well-designed off ramps are part of the sample design
 - Already learning new information about fish presence/density from this work
- What percentage of the population is being caught?
 - The purpose is to get better abundance estimates than the past, so we're still working on that
 - Statisticians put together a report each week, which is posted on the website
 - This info is included in the report on the website
- Future roll-out of overall information?
 - Most likely, but nothing planned at this time
 - Strong encouragement for USFWS to provide an overview report of this effort in the coming years; take this opportunity to think through the crisis from start to finish so we can learn from this and be set up to do this better in the future
- Probably going to get a rest from IEP FLOAT to look at adapting the sampling during summer and fall to leverage more info on habitat use information and condition

- Agencies are already starting to talk about how to do that; how to leverage the high flows from this year
- Also getting samples from the fish?
 - That's a potential option to pursue
 - The goal is to get the most collective value from each individual fish
 - Trying to compare methods from different efforts with the EDSM effort
 - Importance of genetic samples would be a potentially low impact with a high value
 - People are already discussing the possibility of including swabs into the methods
 - USFWS has experience taking DNA on smelt from other projects
 - Catch and release may not be in the permit, need to review and will confirm later
 - Also need to consider the budgetary impacts of adding additional steps to the methods

5. Microcystis Blooms in the Delta: History and Drought Impacts

Peggy Lehman (CDFW), Peggy.Lehman@wildlife.ca.gov;

Sarah Lesmeister (DWR), Sarah.Lesmeister@water.ca.gov

Peggy Lehman -

- During the same period and region, also growth of aquatic weeds. Any interactions identified?
 - Not sure, but there is a lot of shading resulting from the weeds so there could be an impact there.
- What about the control program? Far more intense in 2015 than 2014.
 - That is a factor and there is a proposal in the works to examine that
- Any updates on identifying the other bacteria?
 - Working on that right now, and some identified are more toxic than Microcystis. Now there are 6 species of Microcystis compared to just one.
- Data may be available from the pumping stations that could help
 - Sarah has already met with them to start coordinating efforts
- Where are the other nitrogen sources from?
 - Benthic and decomposition
 - Maybe nutrients coming straight out of the vegetation
- Are these contaminants impacting the survival of fish?
 - Over the long-term, they eat away at the health of the fishery
 - Liver failure, kidneys, and gut alteration
 - Very toxic, generally absorbed through their food, so it depends on what they're eating
 - Different short and long term effects
 - Different toxins in the system have different effects on the fish; some worse than others
- Treatment?

- Difficult because killing the cell actually causes the toxin to be released
- Two stage treatment required
- Killing off one organism may enhance the survival of another

Sarah Lesmeister –

- Relatively routine to collect samples and analyze them now that the infrastructure is in place?
 - Yes
- How expensive are analyses?
 - Microcystis is 200-5—per sample
 - To analyze for all toxins is more expensive
 - Labs at Rancho Cordova can process these samples; multiple other labs to work with; prices vary by lab
 - Right now running samples through Swee Teh, so costs are cheaper
 - Microcystis needs to be sampled more frequently, and that is where the added expense comes in; no new staff or resources being provided for additional work required
- Human health issue that needs to be addressed
 - No new positions to address this in most recent state budget
 - DWR is now coordinating with other efforts and doing what they can to address this issue
- At what point does it stop becoming a monitoring issue, and does it become a human health issue?
 - Agencies have been working on this for the past 5 years
- Any hypoxia observed?
 - Yes, but not sure if the fish kills are related to Microcystis or hypoxia
- How does this approach differ or relate to other programs across the country?
 - Across the nation, there are states with more advancements compared to us. We can model their efforts if the resources are made available here.
- Based on the monitoring, any common pattern with these blooms? Still potential for things getting worse after 18 years. Like invasion biology, there is an invasion and it follows a trajectory. Referring to the intensity of the blooms in the long-term. When do things start to max out or ramp down?
 - Appears to be water-body specific
 - Trying to get water-body managers to develop information on what the pattern is on their water body - when things start, and the factors associated with it.
 - With Microcystis, it is straight algal biomass.
 - Need to look to other places and see those trends and patterns. In the Delta, we are in the low end right now. Some water bodies in CA are reaching some of the highest toxicity levels in the country.
 - Usually requires management actions to change inputs.
 - Microcystis is moving into marine habitats; will likely expand habitat over the next few decades
- Is the satellite map a hyper-spectral image that could be used for other purposes?

- Yes, it could be. And new satellites have gone up recently with higher resolution. Testing algorithms right now.
- Dick Dugdale's group working with Oregon State University on this.

6. California Cyanobacteria and Harmful Algal Bloom (CCHAB) Network and SWAMP Freshwater HABs Project

Jon Marshack (CWQMC), Jon.Marshack@waterboards.ca.gov

- Any focus on shellfish?
 - Primary focus has been on water for drinking and recreation
 - Evidence of toxins accumulating in shellfish and sea otters have died from eating the shellfish
 - Work ongoing in Santa Cruz to examine this
 - Work going on along the coast focuses on toxins produced from marine HABs, not freshwater HABs

7. Stakeholder Updates and Roundtable Discussion

- Dick Pool, GGSA
 - Salmon industry is in bad shape
 - 2015 commercial fisherman couldn't make a living due to lack of fish
 - Natural spawning fish have declined, most drought-related
 - Finishing a report highlighting their take on the issues with the salmon industry
 - CAMT/CSAMP have been discussing salmon for a while now, and want to do more work on salmon; mainly focusing on predation in the Delta
 - Drafted a survey of all activities involving salmon in the central valley; currently 10 pages of activities collected totaling over \$126M
 - One gap appears to be research on predation; not a lot of money directed that way; would like additional information on these efforts
 - Common problem - people aren't always talking about the same thing when they talk about the "predation issue." It would be helpful to define upfront what is meant by this term.
 - Side effort of the floodplain work from DWR is looking at predation
 - Suggestion to coordinate with Sheila Greene
 - Scope is the entire central valley – north and south
- Lisa Thompson, RegionalSan
 - Presentation at the IEP Workshop on March 3
 - New paper out – Kraus et al (2017)
 - <http://onlinelibrary.wiley.com/doi/10.1002/lno.10497/full>
- Delta Smelt Resiliency Strategy Updates below

8. Wrap up

Erwin Van Nieuwenhuyse, USBR

Next IEP Stakeholder Meeting:
May 10, 2017
1:30-3:30pm
Dept. of Water Resources, Room 119
3500 Industrial Blvd., West Sacramento, CA 95691

* IEP does not own any of the content in the presentations, and sharing presentations is at the discretion of the presenters. Please contact presenters directly for a copy of their presentation.

Delta Smelt Resiliency Strategy Updates:

1) Yolo Bypass Summer/Fall Food Web Export Studies Update

- a. 2016 Summer Flow Management Action Summary
 - i. Management PI's:
 - 1. Natural Resources Agency: Kris Tjernell
 - 2. California Fish and Wildlife: Carl Wilcox
 - 3. Department of Water Resources: Cindy Messer
 - ii. Flow Action Pumping Timeline
 - 1. July 11th - Aug 1st Glen Colusa Irrigation District, Reclamation District 108 and Reclamation District 2035 collaborated in pumping water from the Sacramento River into the Colusa Drain and Yolo Bypass Toe Drain.
 - iii. Total Net Discharge Volume measured in lower Yolo Bypass = 12,752 ac-ft.
 - 1. RD 108 volume pumped = 880 ac-ft.
 - 2. RD 2035 volume pumped = 4,160 ac-ft.
 - 3. GCID volume pumped = 9,978 ac-ft.
 - 4. Total volume pumped = 15,018 ac-ft.
 - iv. Total Water Pumping Cost = \$100,365.00 (Note: GCID pumped for no cost)
- b. Chl a/Phytoplankton Data Summary
 - i. Total Chlorophyll doubled in the Lower Yolo Bypass during the flow action
 - ii. Phytoplankton data show a downstream export and vertical mixing of the nutrient rich diatom and cryptophyte species
 - iii. After the flow action total chlorophyll in the lower Sacramento River at Rio Vista observed a 2-5 fold increase – this bloom was dominated by the diatom *Aulacoseira sp.*
- c. Zooplankton Abundance Summary
 - i. Preliminary results show an increase in the total abundance of calanoid copepods (key zooplankton prey items for Delta Smelt and other POD species) after the flow action
- d. Zooplankton Reproductive Rate Summary (collaborative study with SFSU – Wim Kimmerer Lab)

- i. Preliminary results suggest that zooplankton reproductive rate increased in the lower Yolo Bypass post flow action
- e. Project Next Steps
 - i. DWR is finalizing contract w/ CDFW to continue study efforts through 2018
 - ii. DWR is setting up multi-year (2017-2018) Contaminants Contract w/ USGS
 - iii. DWR is setting up multi-year (2017-2018) Primary Productivity Contract w/ San Francisco State University - Dugdale/Wilkerson Lab

2) Outflow Alteration and Delta Smelt

a. Background

- i. In Spring 2016 USFWS requests Reclamation to augment summer outflow of the Sacramento River to benefit the Delta Smelt population. The requested 2016 action never occurred as the amount of water available for outflow was deemed insufficient to provide the intended benefit.
- ii. In spring/summer of 2016 the Delta Smelt Resiliency Strategy was circulated and a final draft released in July 2016. This document included actions related to the augmentation and re-routing of outflow to benefit Delta Smelt.
- iii. In Summer 2016 Reclamation continues groundwork for both implementation and scientific evaluation of outflow augmentation actions with initial project design and related project charter documents being formed and circulated.
- iv. In Fall 2016 the CAMT Outflow Technical Team and IEP Flow Alteration Project Workteam (FLOAT) are formed to assist with science support and guidance of summer outflow projects. Both teams continue to meet regularly and discuss outflow subject matter.

b. Current / Expected

- i. In February 2017 Reclamation sent and discussed the working draft proposal *The Effect of Outflow Alteration upon Delta Smelt Habitat, Condition and Survival* with fellow action agency DWR and regulatory agencies USFWS and CDFW.
- ii. On February 22, 2017 the full IEP-PWT 'FLOAT' will meet for the first time.
- iii. By end of February 2017 substantial monitoring components in place.
- iv. By end of February 2017 FLOAT workplan draft in place.
- v. By end of March 2017 project specific contracts and/or agreements in place.
- vi. May 2017 – earliest project implementation.

3) Delta Smelt Resiliency Strategy Action for Enhanced Aquatic Weed Control- Update

- a. The DSRS action for enhanced aquatic weed control calls for DWR and CDFW to coordinate with the State Parks Division of Boating and Waterways (DBW) to enhance current control efforts for aquatic weeds as a potential mechanism of improving habitat conditions for Delta Smelt.

- b. To plan locations for the control action, an aerial survey acquiring hyperspectral imagery of the Central, Western, and North Delta regions was conducted in October 2016. Imagery is currently being analyzed at UC Davis to produce maps of submerged and floating aquatic vegetation.
- c. Based on preliminary field surveys and mapping results, both Liberty Island and Decker Island areas are being considered for the control action.
- d. The action will occur in both 2017 and 2018, with close monitoring of treatment effects on the vegetation, water quality, and the local food web. Results from 2017 will inform the action conducted in 2018. Aerial surveys will continue in falls of 2017 and 2018 to monitor trends in coverage and regional effects of control efforts.
- e. Control action monitoring work will be a joint effort among DWR, DBW, and CDFW. Specific metrics to be monitored will be based on aquatic vegetation conceptual models recently developed by the IEP Aquatic Vegetation Project Work Team.

4) Updates on the IEP project “Abundance Estimates of Winter-run Exiting/Entering the Delta”

- a. We conducted a pilot effort in 2016 and found trawl efficiency to be 0.0179, and survival of winter run acoustic tag fish of 0.21 at Chipps Island. Only three genetic winter run were captured at Chipps Island.
- b. The preliminary Winter Run abundance estimate is 3,274 (median of the posterior distribution) and the 90% credible interval (5th - 95th percentile) is 975 - 8,112. This compares to 30,000 - 45,000 winter run fish estimated annually between 2008 and 2011 at Chipps Island, using previous estimates of trawl efficiency. This low abundance is consistent with the high mortality in egg stage and low captures in salvage which indicated poor recruitment success of this cohort
- c. Plans are to increase trawling efforts from 7 days rather than 3 days at week, starting February 1 at both Sacramento and Chipps Island. Based on pilot efforts our limitation on precision was the number of true genetic WR. We are trying to increase effort to recapture more.
- d. We are increasing the number of AT and CWT releases this year by taking advantage of CWT hatchery production already occurring. This will allow us to estimate trawl efficiency over more release groups, run types, and conditions. We have been coordinating with hatchery managers.
- e. The 12 Receivers, ordered by CDFW have just been delivered and have recently or will soon be deployed. Tags have been ordered and the NOAA agreement is on schedule. We potentially have gotten funds from CVPIA to fund the analyses component of the project (\$303,000) in 2017.